INTERNET INFRASTRUCTURE AND HUMAN RIGHTS:
A READING LIST

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INTRODUCTION

The infrastructure upon which the Internet is built determines who can be online, who they can communicate with, what they can access, and how this all works. The decisions that shape the Internet infrastructure can both advance and restrict how users communicate and how information is accessed and shared, thus having a significant effect on how the Internet can impact the public interest, especially in regards to social justice, civil liberties, and human rights.

The design and governance of the Internet infrastructure have significant political and economic implications that affect the rights of users around the globe. Knowing how the mechanisms and practices embedded in the Internet's underlying technology work is key to understanding and advocating for societal and political developments.

This reading list is designed for civil society actors, technologists, policy makers, and users who wish to learn about the inner workings of the Internet infrastructure in order to approach its growth and the application of its governance as a site of advocacy. In addition to an introduction to the topic and a curated collection of readings, this resource also includes an index of civil society organizations that are actively advocating for a public interest Internet infrastructure, to inspire readers to further explore and engage with current and future initiatives and campaigns.

INTERNET GOVERNANCE AND INFRASTRUCTURE

Over the last few decades, political and legislative bodies have started to codify the relationship between the Internet and human rights.

In 2005, the Tunis Agenda for the Information Society stated that "measures undertaken to ensure Internet stability and security, to fight cybercrime and to counter spam, must protect and respect the provisions for privacy and freedom of expression as contained in the relevant parts of the Universal Declaration of Human Rights and the Geneva Declaration of Principles."

In 2012, the UN Human Rights Council adopted a key resolution on the promotion, protection, and enjoyment of human rights on the Internet, affirming that "the same rights that people have offline must also be protected online."

These efforts have mostly focused on Internet governance from a regulatory perspective. However, governance of the Internet infrastructure can also critically influence the rights of Internet users.

By enabling and controlling the exchange of information on a global scale, the decisions that determine how the Internet infrastructure is built and maintained can affect fundamental rights such as privacy, security, anonymity, and freedom of expression and information.

The Internet is a global network of networks, bound together through standards and protocols, relying on hardware and software for information flow. It is decentralized, complex, and multilayered. Because of its globally distributed nature it does not have a central governing body, and its interoperability and maintenance are managed by a multitude of public and private entities.

Internet governance is collectively enacted by the design of technology, the policies of private companies, the administrative functions of global standard-setting organizations, national laws, and international agreements. This convergence of actors with vastly different levels of power, influence, and interests presents a wide range of technical, political, and cultural challenges.

ADVOCATING FOR A PUBLIC INTEREST INTERNET INFRASTRUCTURE

The multistakeholder Internet governance arrangement allows civil society organizations—where human rights advocacy has its strongest representation—to directly participate in the creation of the policies that govern the Internet.

However, while established paths of human rights advocacy most often take the form of legal resolutions and reforms in governmental and corporate policies, engaging with Internet infrastructure development presents very different challenges. In order to influence the design of the Internet infrastructure, actors must address complex technical issues. This requires public interest advocates to envision new ways to promote human rights and justice values in the development of the Internet infrastructure by seeking to reconfigure large technical systems instead of laws.

Many civil society organizations lack the resources and capacity to address the technical arguments needed to effectively participate in standard-setting forums. At the same time, governments and private corporations have ample capability to steer decisions towards resolutions that, while meeting their commercial and political needs, can also hinder user rights.

Decision-making regarding the Internet infrastructure is a matter of social policy. To advance the protection of all users' ability to exercise their rights online, there is an urgent need for civil society and the broader public interest technology ecosystem to impactfully participate in the decision-making processes that govern the infrastructure.

Strategic and long-term advocacy efforts toward the development of a public interest Internet infrastructure require multiple skills in governance and standardization processes; these efforts can most effectively be sustained by cross-domain collaboration among civil society actors, technologists, private sector representatives, policy makers, and researchers who strive to promote the Internet's role in supporting user rights.

A multidisciplinary support ecosystem needs to be developed and bolstered to leverage the efforts of public interest advocates in the face of the economic and social incentives working against them.

Financial support is key, but it is also not sufficient. Critical efforts that can lay the foundation for public interest advocacy in this field also include developing capacity building programs, prototyping pathways to strengthen the inclusion of human rights-focused perspectives—especially by underrepresented and marginalized stakeholders—in the Internet infrastructure decision-making processes, and producing research that highlights how properties of the design of Internet protocols and standards can be used to endanger rights such as freedom of expression and information and the rights to privacy, security, and anonymity.

GLOBAL INTERNET USER STATS

Over 3.8 billion people have access to the Internet.

According to Freedom House estimates:

71% live in countries where individuals were arrested or imprisoned for posting content on political, social, or religious issues.

65% live in countries where individuals have been attacked or killed for their online activities since June 2018.

59% live in countries where authorities deployed pro-government commentators to manipulate online discussions.

56% live in countries where political, social, or religious content was blocked online.

46% live in countries where authorities disconnected Internet or mobile networks, often for political reasons.

46% live in countries where access to social media platforms was temporarily or permanently restricted.

ABOUT THIS READING LIST

In order to forge paths to action and change, advocates need to ground their strategies in understanding the power dynamics and interests at play in the spaces in which they operate.

Understanding how the Internet infrastructure came to be, how it works, and how it is governed allows advocates to identify and challenge whose interests are—or are not—represented in its development, and who is ultimately leveraging their power to influence decision-making processes.

In order to better build capacity across sectors, it is of the utmost importance to create resources designed for both technical and non-technical stakeholders to build knowledge and generate critical discussions on how the Internet infrastructure impacts human rights. Such resources can provide the opportunity to strengthen the understanding of how engineering decisions have contributed to build this infrastructure, and of the politics embedded in the Internet's ever-changing socio-technical systems. They ultimately constitute tools for advocates to examine the infrastructure critically and to strategically envision how to hold the decision makers who shape it accountable to the public interest.

This reading list has been developed as an introductory resource for anyone looking to garner greater understanding of how the Internet infrastructure operates and how the public policy embedded within its architecture can either contribute to advance the protection of human rights online or be exploited to restrict access, limit freedom of expression, exercise surveillance, and impose censorship.

The list operates on the premise that continuously exploring how technology and society co-develop is essential in building a critical understanding of technological development and its impact on human rights. Strengthening awareness of how a system is built and the power dynamics that shape it is a fundamental preliminary step in acquiring the knowledge necessary to identify and challenge decisions that may hinder the rights of users.

As such, the list also includes information beyond an exclusive focus on Internet infrastructure and governance. Its purpose is to provide knowledge that can help to better examine the historical, social, political, and economic contexts that are impacted by technology infrastructures. This list is organized into themes and includes selections that detail what can be considered an infrastructure, how infrastructures can be built and maintained, what affects technology development and use, and how the power that shapes information flow and access is held—and how it can be shifted.

The texts in the list constitute an introductory sample of work on these topics. They include writings on widely discussed subjects, as well as publications on issues often underrepresented in mainstream debates on Internet infrastructure development and governance. To assist the reader in exploring the collection, each title includes an excerpt that highlights key argumentative points.

The list consists of English-language texts as this is the language shared by the author, those who inspired its creation, and the collaborators who supported its publication. This language choice is exclusively motivated by this practical reason, and it does not mean that the most relevant literature on these topics is written in English.

This compilation is a tool that can be used by individuals as well as study groups, and it seeks to inspire readers to keep exploring the issues and perspectives that are most relevant to the context in which they operate, whether through a technical, theoretical, sociological, advocacy, or policy perspective.

For anyone interested in learning more about current and emerging initiatives on these subjects, there is a section at the end of the list that features a selection of civil society organizations that do remarkable work in this field.

INTERNET INFRASTRUCTURE AND HUMAN RIGHTS: A READING LIST

TECHNOLOGY AND THE INTERNET

The Ethics of Invention: Technology and the Human Future – Sheila Jasanoff. W. W. Norton & Company, 2016.

"Technology [...] has made huge strides in recent decades, but those developments raise ethical, legal, and social quandaries that call for deeper analysis and wiser response. Most visible perhaps is responsibility for risk. Whose duty is it in today's complex societies to foresee or forestall the negative impacts of technology, and do we possess the necessary tools and instruments for forecasting and preventing harm? Inequality raises an equally urgent set of questions. How are technological developments affecting existing gaps in wealth and power, and what steps can be taken to ensure that innovation will not worsen those disparities? A third group of concerns focuses on eroding morally significant commitments to nature and, above all, human nature. Technological developments threaten to destroy cherished landscapes, biological diversity, indeed, the very concept of a natural way of life." (page 7)

Inventing the Internet – Janet Abbate. MIT Press, 1999.

"The history of the Internet holds a number of surprises and confounds some common assumptions. The Internet is not a recent phenomenon; it represents decades of development. The US military played a greater part in creating the system than many people realize, defining and promoting the Internet technology to serve its interests. Network projects and experts outside the United States also made significant contributions to the system that are rarely recognized. Above all, the very notion of what the Internet is—its structure, its uses, and its value—has changed radically over the course of its existence. The network was not originally to be a medium for interpersonal communication; it was intended to allow scientists to overcome the difficulties of running programs on remote computers. The current commercially run, communication-oriented Internet emerged only after a long process of technical, organizational, and political restructuring. [...] The history of the Internet is not [...] a story of a few heroic inventors; it is a tale of collaboration and conflict among a remarkable variety of players." (pages 2–3)

Histories of Networking vs. the History of the Internet – Andrew L. Russell. Paper presented at the 2012 SIGCIS Workshop, October 7, 2012.

"In this paper I describe the difference between "the history of the Internet" and "histories of networking." [...] "I argue that there is an opportunity now for historians to talk more about the latter category, "histories of networking," which includes both the Arpanet and Internet as only part of the story. Histories of networking also include developments in data networking, telecommunications, and wireless transmission that took place in other countries or that do not fit neatly into the narrative of the Internet's success—in other words, projects that are not necessarily part of the established linear history of the Internet but are nevertheless important to describe and to understand. The goal for this paper, therefore, is to destabilize the American-centric, triumphalist, and teleological narrative of linear success—from Arpanet to Internet to global information society—that is so pronounced in the existing popular accounts of the history of the Internet." (page 1)

INFRASTRUCTURES AND STANDARDS

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Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces – Susan Leigh Star and Karen Ruhleder. Information Systems Research, 7(1), pages 111–134, 1996.

"Most of us, in speaking loosely of infrastructure, mean those tools which are fairly transparent for most people we know about, wide in both temporal and spatial scope, embedded in familiar structures—like power grids, water, the Internet, airlines. That loose talk is perfectly adequate for most everyday usage, but is dangerous when applied to the design of powerful infrastructural tools on a wide scale, such as is now happening with "national information infrastructures." Most importantly, such talk may obscure the ambiguous nature of tools and technologies for different groups, leading to de facto standardization of a single, powerful group's agenda." (pages 113–114)

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The Politics and Poetics of Infrastructure – Brian Larkin. Annual Review of Anthropology, 42(1), pages 327–343, 2013.

"Infrastructures are matter that enable the movement of other matter. Their peculiar ontology lies in the facts that they are things and also the relation between things. As things they are present to the senses, yet they are also displaced in the focus on the matter they move around. We often see computers not cables, light not electricity, taps and water but not pipes and sewers. As technological objects they demand to be examined in the long tradition of theorizing technology [...]. Yet the duality of infrastructures indicates that when they operate systemically they cannot be theorized in terms of the object alone. What distinguishes infrastructures from technologies is that they are objects that create the grounds on which other objects operate, and when they do so they operate as systems." (page 329)

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Got Infrastructure? How Standards, Categories and Other Aspects of Infrastructure Influence Communication – Susan Leigh Star. The 2nd Social Study of IT Workshop at the LSE. ICT and Globalization, April 22-23, 2002.

"Defining infrastructure is not as obvious as it may seem. I had a common sense notion of infrastructure when I first started studying the design of interdisciplinary computer systems—infrastructure as something that other things "run on," things that are substrate to events

and movements. [...] Good infrastructure is by definition invisible, part of the background for other kinds of work. It is ready-to-hand. [...] However, in light of a deeper analysis of infrastructure, and especially to understand large-scale technical systems in the making, or to examine the situations of those who are not served by a particular infrastructure, this definition is both too shallow and too absolute. [...] For the blind person, the graphics programming and standards for the World Wide Web are not helpful supporters of computer use, but barriers that must be worked around (Star, 1991). One person's infrastructure is another's brick wall, or in some cases, one person's brick wall is another's object of demolition. [...] infrastructure is a fundamentally relational concept, becoming real infrastructure in relation to organized practices [...]." (page 16)

OPEN STANDARDS AND OPEN SOURCE SOFTWARE

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Open Standards in the Digital Age: History, Ideology, and Networks – Andrew L. Russell. Cambridge University Press, 2014.

Also: Andrew L. Russell talking about the book in an interview by Jasmine McNealy for the New Books in Technology podcast, March 2014.

"The distinction between a standard and standardization is instructive. The term "standard" often refers to customs or norms, but it also has more specific meanings that refer to documented practices or to a particular type of product: a technical specification for the composition, interfaces, or characteristics of a given material, such as the quality of a steel rail, the size and angle of a screw thread, or a common measure of electrical resistance. [...] "Standardization" is the term that describes

the process of making standards—a process that entails a wide range of practices and ideas with distinct political, economic, and cultural dimensions. Specific industrial standards embody the dominant values and assumptions that emerge during the process of standardization. They are simultaneously social constructions and material realities. As standards emerge from contested contexts, they immediately function as a means of control within the political and economic order." (page 17)

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Two Bits: The Cultural Significance of Free Software – Christopher M. Kelty. Duke University Press, 2008.

"This is a book about Free Software, also known as Open Source Software, and is meant for anyone who wants to understand the cultural significance of Free Software. [...] Free Software is [...] public; it is about making things public. This fact is key to comprehending its cultural significance, its preface appeal, and its proliferation. Free Software is public in a particular way: it is a self-determining, collective, politically independent mode of creating very complex technical objects that are made publicly and freely available to everyone—a "commons," in common parlance. It is a practice of working through the promises of equality, fairness, justice, reason, and argument in a domain of technically complex software and networks, and in a context of powerful, lopsided laws about intellectual property." (pages ix–xi)

NETWORKS, PROTOCOLS, AND POWER

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The Stuff of Bits. An Essay on the Materialities of Information – Paul Dourish. MIT Press, 2017.

"Understanding the Internet as a specific network, one that has been designed around particular protocols and particular technological and ideological commitments, is sometimes difficult given how universal it has become, so that talk of "the Internet" and of "digital networking" is sometimes hard to distinguish. It is necessary, however, if we are to be able to historicize the Internet, to understand its material shifts and reconfigurations, and thus recover a sense of its current specificities and potential futures. By following the evolution of digital networking in general and hence contextualizing the Internet in particular, and then by looking at particular protocols and their representational entailments, these chapters [chapters 6 and 7] illustrate how a materialist account can provide an entry point to much broader concerns than simply infrastructures and their configurations, opening up questions of power, policy, and polity in the realm of the digital." (pages 30–31)

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Protocol Politics. The Globalization of Internet Governance – Laura DeNardis. MIT Press, 2009.

"A central thesis of this book is that protocols are political. They control the global flow of information and make decisions that influence access to knowledge, civil liberties online, innovation policy, national economic competitiveness, national security, and which technology companies will succeed. From a technical standpoint, protocols can be difficult to grasp because they are intangible and often invisible to Internet users. They are not software code nor material products but are language—textual and numerical language. [...] Technical

protocols are functionally similar to real-world protocols. Cultural protocols are not necessarily enshrined in law, but they nevertheless regulate human behavior." (page 6)

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The Geopolitical vs. the Network Political: Internet Designers and Governance – Sandra Braman. International Journal of Media and Cultural Politics, 9(3), pages 277–296, September 2013.

"With the recognition that communication networks in general and the Internet in particular are not only infrastructural but socio-technical in nature comes the responsibility to think such networks through from the perspective of how they influence—and/or are—forms of power and governance. The notion of citizenship is one that appears relative to both social and technical systems, and thus at their conjuncture, because it is the concept through which the rights and responsibilities of individuals relative to governance are refracted. It was in fact the case that citizenship was a concern for those responsible for technical design of the Internet as that history both unfolded through and is recorded in the technical document series known as the Internet Requests for Comments, or RFCs. This paper analyzes the two types of citizenship of concern from the perspective of Internet design—geopolitical (oriented around the state) and network political (oriented around the network)—and interactions between the two as they were discussed within and affected the Internet design process. These network-inspired ideas about citizenship in turn contribute to the ongoing discussion about the evolution of new forms of citizenship in today's environment, including in particular those that are global and/or technological in nature." (page 277)

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Where in the World is the Internet? Locating Political Power in Internet Infrastructure
– Ashwin Jacob Mathew. PhD dissertation. University of California, Berkeley, 2014.

"When political power is located in the context of the Internet, the focus is often on phenomena unfolding at the "ends" of the Internet, involving Internet users and Internet content and application providers. Important debates emerge from these studies, engaging with issues including free speech, intellectual property, security and privacy. However, these debates are themselves made possible only through Internet infrastructure, where a disjuncture is produced between the physical space of infrastructure and the virtual space of new media. [...] If we are to understand the nature of the information society, it is essential to analyze the processes through which the seemingly placeless nature of the virtual space of the Internet is produced." (page 2)

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The Stack. On Software and Sovereignty
– Benjamin H. Bratton. MIT Press, 2016.

"This book is both technical and theoretical. It is unapologetically interdisciplinary in its perspective and its project; it is a work of political philosophy, and architectural theory, and software studies, and even science fiction. It draws links between technologies, places, processes, and cultures that may exist at different scales but which are also deeply interrelated. In this crisscross, we observe that "computation" does not just denote machinery; it is planetary-scale infrastructure that is changing not only how governments govern, but also what governance even is in the first place. Computation is a logic of culture, and so also a logic of design. It is both how our culture designs and is itself that which we need to design better, but to do that we need to take a step back and view an emerging big picture that is different

from what has been predicted. We may glimpse that another model of political geography is cohering before our eyes. What can we do with it? What does it want from us? The answers depend on our theories and tools, on our models and codes." (page xvii)

TOWARDS A PUBLIC INTEREST INTERNET INFRASTRUCTURE

Internet Architecture and Human Rights: Beyond the Human Rights Gap – Monika Zalnieriute, Stefania Milan. Policy & Internet. Special Issue: Internet Architecture and Human Rights, 11(1), pages 6–15, March 2019.

"We argue that there is a vacuum which occurs when human rights are public [...] and the Internet architecture—through which human rights online are largely mediated and governed today—is mainly privately owned or privately operated. This vacuum creates what we call a "human rights gap" whereby the delegation of human rights enforcement to private actors circumvents both international human rights law, and often domestic laws and constitutions as well." (page 8)

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Media Development in the Digital Age: Five Ways to Engage in Internet Governance – Corinne Cath, Niels ten Oever and Daniel O'Maley, Center for International Media Assistance, March 22, 2017.

"The digital convergence means that how the Internet develops going forward—both in terms of policy and technology—will shape the very environment in which all other media operate. This report makes the case to this community that they can, and must, engage in the decision-making bodies that are shaping Internet governance (IG) to ensure that the Internet—and the growing media sphere it sustains—remains open, pluralistic, and democratic."

Coding and Encoding Rights in Internet Infrastructure – Stefania Milan and Niels ten Oever. Internet Policy Review, 6(1), January 2017.

"This article explores bottom-up grassroots ordering in internet governance, investigating the efforts by a group of civil society actors to inscribe human rights in internet infrastructure, lobbying the Internet Corporation for Assigned Names and Numbers. Adopting a Science and Technology Studies (STS) perspective, we approach this struggle as a site of contestation, and expose the sociotechnical imaginaries animating policy advocacy. Combining quantitative mailing-list analysis, participant observation and qualitative discourse analysis, the article observes civil society in action as it contributes to shape policy in the realm of institutional and infrastructure design." (page 1)

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The Design of the Internet's Architecture by the Internet Engineering Task Force (IETF) and Human Rights – Corinne Cath and Luciano Floridi. Science and Engineering Ethics, 23(2), pages 449–468, June 2016.

"The debate on whether and how the Internet can protect and foster human rights has become a defining issue of our time. This debate often focuses on Internet governance from a *regulatory perspective*, underestimating the influence and power of the governance of the Internet's *architecture*. The technical decisions made by Internet Standard Developing Organisations (SDOs) that build and maintain the technical infrastructure of the Internet influences how information flows. They rearrange the shape of the technically mediated public sphere, including which rights it protects and which practices it enables. In this article, we contribute to the debate on SDOs' ethical responsibility to bring their work in line with human rights. We defend three theses. First, SDOs' work is inherently political. Second, the Internet Engineering Task Force (IETF), one of the most influential SDOs, has a moral obligation to ensure its work is coherent with, and fosters, human rights. Third, the IETF should enable the actualisation of human rights through the protocols and standards it designs by implementing a responsibility-by-design approach to engineering. We conclude by presenting some initial recommendations on how to ensure that work carried out by the IETF may enable human rights." (page 449)

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Privacy by Infrastructure: The Unresolved Case of the Domain Name System – Samantha Bradshaw, Laura DeNardis. Policy & Internet. Special Issue: Internet Architecture and Human Rights, 11(1), pages 16–36, March 2019.

"Digital privacy concerns are primarily viewed through the lens of personal data and content. But beneath the layer of content, less visible issues of infrastructure design and administration raise significant privacy concerns. The Internet's Domain Name System (DNS) is one such terrain. [...] DNS privacy challenges not only demonstrate the important connection between infrastructure and rights, but also exemplify how cross-border, universal technologies come into conflict with the bounded laws of nation states. It is a critical moment of opportunity to examine these cases because their resolution will help determine the future of basic privacy rights online." (page 16)

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The Snowden Disclosures, Technical Standards,
and the Making of Surveillance Infrastructures
– Michael Rogers, Grace Eden. International Journal
of Communication, 11, pages 802–823, 2017.

"The Snowden documents have revealed that
intelligence agencies conduct large-scale digital
surveillance by exploiting vulnerabilities in
the hardware and software of communication
infrastructures. These vulnerabilities have been
characterized as "weaknesses," "flaws," "bugs," and
"backdoors." Some of these result from errors in
the design or implementation of systems, others
from unanticipated uses of intended features. A
particularly subtle kind of vulnerability arises
from the manipulation of technical standards to
render communication infrastructures susceptible
to surveillance. Technical standards have a
powerful influence on our digital environment:
They shape the conditions under which digital
citizenship is exercised. The Snowden revelations
brought to the forefront the role of intelligence
agencies in the standards-making process, lending
new urgency to the debate over the adequacy
and legitimacy of the current mechanisms used
for negotiating standards. This article explores
how influence is exercised in the production of
standards and the implications this has for their
trustworthiness and integrity." (page 802)

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Freedom on the Net measures the level of Internet and digital media freedom in 65 countries. Each country receives a numerical score from **100 (the most free)** to **0 (the least free)**, which serves as the basis for an Internet freedom status designation of **FREE (70–100 points)**, **PARTLY FREE (40–69 points)**, or **NOT FREE (0–39 points)**.

Ratings are determined through an examination of three broad categories:

A. OBSTACLES TO ACCESS: Assesses infrastructural and economic barriers to access; government efforts to block specific applications or technologies; and legal, regulatory, and ownership control over Internet and mobile phone access providers.
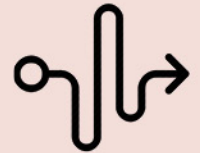
B. LIMITS ON CONTENT: Examines filtering and blocking of websites; other forms of censorship and self-censorship; manipulation of content; the diversity of online news media; and usage of digital media for social and political activism.
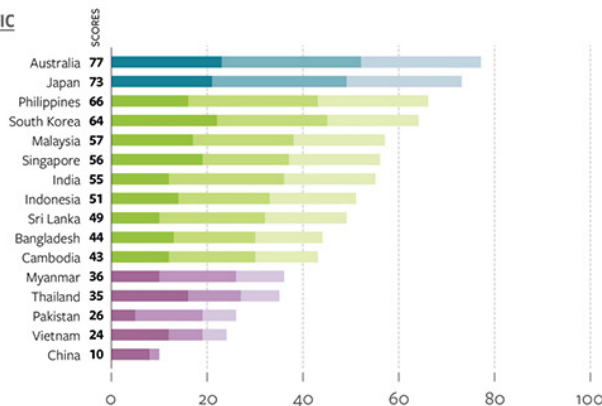
C. VIOLATIONS OF USER RIGHTS: Measures legal protections and restrictions on online activity; surveillance; privacy; and repercussions for online activity, such as legal prosecution, imprisonment, physical attacks, or other forms of harassment.
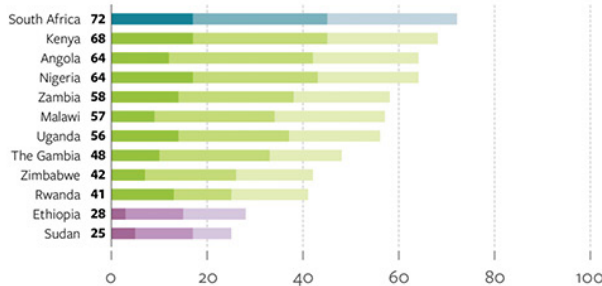
REGIONAL RANKINGS

Freedom of the Net 2019 covers 65 countries in six regions around the world. The countries were chosen to illustrate Internet freedom improvements and declines in a variety of political systems.
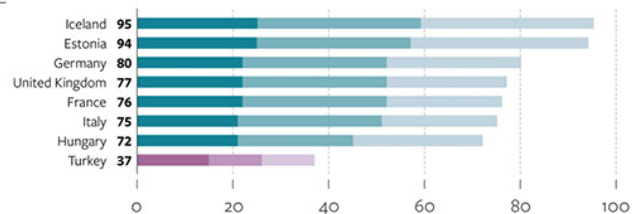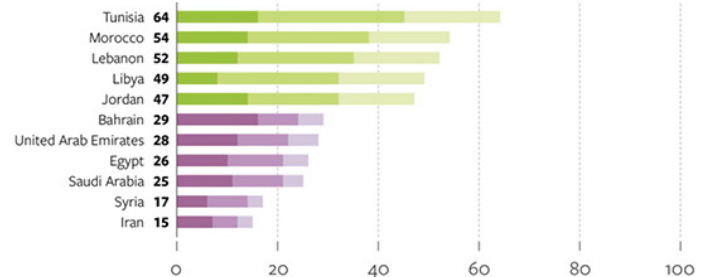
ASIA-PACIFIC

SCORES

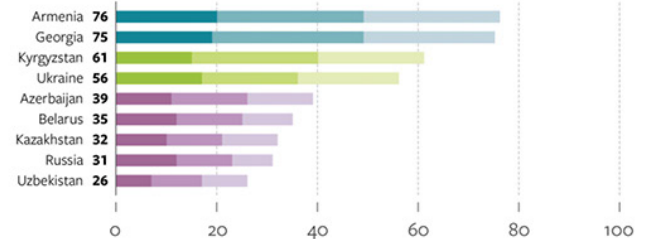| Country	Score
Australia	77
Japan	73
Philippines	66
South Korea	64
Malaysia	57
Singapore	56
India	55
Indonesia	51
Sri Lanka	49
Bangladesh	44
Cambodia	43
Myanmar	36
Thailand	35
Pakistan	26
Vietnam	24
China	10

SUB-SAHARAN AFRICA

Country	Score
South Africa	72
Kenya	68
Angola	64
Nigeria	64
Zambia	58
Malawi	57
Uganda	56
The Gambia	48
Zimbabwe	42
Rwanda	41
Ethiopia	28
Sudan	25

EUROPE

Country	Score
Iceland	95
Estonia	94
Germany	80
United Kingdom	77
France	76
Italy	75
Hungary	72
Turkey	37

MIDDLE EAST AND NORTH AFRICA

Country	Score
Tunisia	64
Morocco	54
Lebanon	52
Libya	49
Jordan	47
Bahrain	29
United Arab Emirates	28
Egypt	26
Saudi Arabia	25
Syria	17
Iran	15

EURASIA

Country	Score
Armenia	76
Georgia	75
Kyrgyzstan	61
Ukraine	56
Azerbaijan	39
Belarus	35
Kazakhstan	32
Russia	31
Uzbekistan	26

AMERICAS

Country	Score
Canada	87
United States	77
Argentina	72
Colombia	67
Brazil	64
Ecuador	61
Mexico	60
Venezuela	30
Cuba	22

A. Obstacles to Access
B. Limits on Content
C. Violations of User Rights

A B C
FREE
PARTLY FREE
NOT FREE

0 = Least Free
100 = Most Free

Public Interest, Private Infrastructure: An Analysis of the Barriers and Drivers for Adopting Human Rights Standards in the Internet Infrastructure Industry – ARTICLE 19, 2018.

"While some Internet infrastructure providers have acknowledged their influence and established safeguards against abuse of their services, the majority have yet to align their policies and practices with international human rights standards. [...]

This report examines the most influential catalysts and barriers that shape Internet infrastructure providers' behavior regarding human rights. The report focuses on providers' adoption of the UN Guiding Principles on Business and Human Rights (UNGPs), a widely accepted global standard defining responsibilities of businesses.

Adoption of the UNGPs serves as a valuable metric for understanding how companies are fulfilling their positive responsibilities to mitigate human rights impacts of their operations, publish transparency reports, and provide remedy for potential human rights violations." (pages 4–5)

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Internationalization of the Internet by Design: The First Decade – Sandra Braman. Global Media and Communication, 8(1), pages 27–45, 2012.

"The successes and failures of Internet Internationalization reveal struggles between two systems: the network political (oriented around the machinic) and the geopolitical (oriented around the social). The frames through which this conflict are understood, and the technical decisions that enacted such frames, were put in place during the first decade of the network design process, 1969–79. Analysis of the technical document series that records the history of that process provides evidence of internationalization processes that include extension of the network outside of the United States, international participation in the design conversation, the influence of international organizations and associations, support for internationalization in the design criteria that serve as policy principles, and attention to issues raised by internationalization within the course of technical decision-making." (page 27)

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Internet Architecture and Disability – Blake E. Reid. 95 Indiana Law Journal 591, University of Colorado Law School Legal Studies Research Paper No. 19-10, pages 591–647, February 2019.

"The Internet is essential for education, employment, information, and cultural and democratic participation. For tens of millions of people with disabilities in the United States, barriers to accessing the Internet, including the visual presentation of information to people who are blind or visually impaired, the aural presentation of information to people who are deaf or hard of hearing, and the persistence of Internet technology, interfaces, and content without regard to prohibitive cognitive load for people with cognitive and intellectual disabilities collectively pose one of the most significant civil rights issues of the information age. Yet disability law lacks a comprehensive theoretical approach for fully facilitating Internet accessibility. The prevailing doctrinal approach to Internet accessibility seeks to treat websites as metaphorical "places" subject to Title III of the ADA [Americans with Disabilities Act], which requires places of public accommodations to be accessible to people with disabilities. While this place-centric approach to Title III has succeeded to a significant degree in making websites accessible over the last two decades, large swaths of the Internet—more broadly construed to include Internet technologies beyond websites—remain inaccessible to millions of people with a variety of disabilities." (page 591)

CONNECTIVITY, NETWORK SOVEREIGNTY, AND COMMUNITY NETWORKS

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The Undersea Network – Nicole Starosielski. Duke University Press, 2015.

"Undersea fiber-optic cables are critical infrastructures that support our global network society. They transport 99 percent of all transoceanic digital communications, including phone calls, text and e-mail messages, websites, digital images and video, and even some television [...]. It is submarine systems, rather than satellites, that carry most of the Internet across the oceans. Cables drive international business: they facilitate the expansion of multinational corporations, enable the outsourcing of operations, and transmit the high-speed financial transactions that connect the world's economies." (page 1)

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Colonial Topographies of Internet Infrastructure: The Sedimented and Linked Networks of the Telegraph and Submarine Fiber Optic Internet – Dhanashree Thorat. South Asian Review. Volume 40, Issue 3: South Asian Digital Humanities Then and Now, pages 252–267, 2019.

"Outlining the development of the telegraph as a technology of colonial control and its strategic deployment in places of military and commercial importance to the colonial administration in India, I argue that both these facets, the creation and deployment of the telegraph network, constitute a crucial historical context for the submarine cable network in the region today. I also frame new cable projects undertaken in the oceanic pathways between South Asia, East Africa, and the Middle East as decolonial infrastructural models envisioning alternate structures of ownership, governance, and regional co-operation." (page 252)

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Global Information Society Watch 2018: Community Networks – preface by Chat Garcia Ramilo. Association for Progressive Communications and International Development Research Centre, November 2018.

"Community networks are "communication networks built, owned, operated, and used by citizens in a participatory and open manner." This is a starting point. As the 43 country reports gathered here show, in practice, "community networks" can be hybrid systems, with different political and practical objectives. The country reports cover a diverse range of countries such as Georgia, Nepal, South Africa, India, Argentina, Honduras, Portugal, Germany and the Democratic Republic of Congo. [...] The country reports are framed by eight thematic reports. [...] The themes include the need for telecommunication regulation institutions to take into account the steep reductions in costs that wireless technologies have effected and to redesign regulation to further community networks; the need to increase awareness of "community stories" and the power structures embedded in those stories; the need to foster the transformation of local social structures and power relationships to enhance the agency of women and give them real power; the need to increase meaningful local content that is conducive to social change; and the need to explore ways for community networks to achieve financial sustainability." (page 5)

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Feminist Infrastructure and Community Networks: An Opportunity to Rethink Our Connections from the Bottom Up, Seeking Diversity and Autonomy – Bruna Zanolli, Carla Jancz, Cristiana Gonzalez, Daiane Araujo dos Santos, Débora Prado. Chapter in Global Information Society Watch 2018: Community Networks, Association for Progressive Communications and International Development Research Centre, pages 42–51, November 2018.

"The operation of a community network implies relationships between a multiplicity of individuals and social groups with different perspectives, interests and needs, and who are not affected in the same way by socio-technical systems given existing inequalities such as race, class, nationality and gender. This means that technology initiatives and the way that they are framed can produce inequalities and differences that emphasise the political structuring of the social world emerging under the impact of the material internet infrastructure. Community networks also show that technology is a terrain of struggle on which hegemonic forces express themselves through specific design strategies in opposition to non-hegemonic groups that are nevertheless more or less successful in influencing the future form of the network infrastructure with which they are engaged." (page 42)

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The Right to the Network: On Capitalism and Next Generation Networks – Peter Bloom. Rhizomatica, June 10, 2019.

"[...] most national constitutions and policies and the UN already recognize access to information and communication as a fundamental human right. The problem is that the details around how people can actually exercise their rights are vague or non-existent. There are two related strategies we should employ. One is pushing for better policies and regulations that force governments and companies to invest in infrastructure in un-connected places, open and fair access to spectrum, interconnection and rights of way for community networks and SME's, and effective use of and access to the incredible amounts of money salted away in Universal Service Funds. [...] The other option amounts to exercising our "Right to the Network" through civil disobedience: building our own networks [...]."

Network Sovereignty: Building the Internet Across Indian Country – Marisa Elena Duarte. University of Washington Press, 2017.

"I write this book to (1) weave Native and Indigenous thought more firmly and productively into the broad fields of science, technology, and society studies; (2) introduce Native and Indigenous thinkers to the language of information science and sociotechnical systems; and (3) share what I have learned thus far about the uses and implications of broadband Internet in Indian Country with colleagues in the sciences, students, educators, policy makers, tribal leaders, and the general public. [...] As Indigenous thinkers are well aware, a mechanism of colonization is the subjugation of Indigenous knowledge. Through centering Native experiences and weaving together Indigenous and information scientific methodologies, this book challenges the shadow of epistemic injustice. However, this work is not intended to serve as an exhaustive Indigenous critique of techno-science; rather, it is intended to open up new ways of thinking about digital technologies, and specifically of high-speed Internet, in Indian Country." (pages 6–7)

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Racial and Ethnic Inclusion in the Digital Era: Shifting Discourses in Communications Public Policy – Mari Castañeda, Martha Fuentes-Bautista, Felicitas Baruch. Journal of Social Issues, Volume 71, No. 1, pages 139–154, 2015.

"This article demonstrates that the new digital environment is introducing a vision that has the potential to be inclusive of all people, especially from traditionally marginalized groups. The application of a critical discourse analytical framework is useful for a more nuanced analysis of how frames of inclusion of vulnerable populations are shaped in the emerging broadband public policy plan. [...]

Issues of price, digital literacy, and relevant content emerged as critical to address diversity concerns. Providing adequate access to broadband is believed to enrich everyone and support civic engagement.

Yet this shift is not entirely about a commitment to social justice but rather a democratic imperative that favors market orientations over social inclusion. [...] We are not alone in pointing out the contradictions and tensions of today's communication policy, which emphasizes market and economic welfare goals over social objectives [...]." (pages 151–152)

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The Impact of New and Emerging Internet Technologies on Climate Change and Human Rights – Kira Allmann and Mike Hazas. Submission to the Advisory Committee to the UN Human Rights Council. University of Oxford and Lancaster University, October 2019.

"The expansion and enhancement of Internet infrastructure is often pursued in the interest of multifarious goals, ranging from increasing the speed and capacity of existing Internet networks to connecting the unconnected. This submission highlights two interrelated technological risks to human rights associated with Internet infrastructure: the environmental impact of Internet connectivity and the growing disparity in quality of Internet access worldwide." (page 1)

SELECTED LIST OF CIVIL SOCIETY ORGANIZATIONS ADVOCATING FOR A PUBLIC INTEREST INTERNET INFRASTRUCTURE

In order to provide a snapshot of some of the many efforts advocating for a public interest Internet infrastructure carried out across the world, this resource also includes a selected list of civil society organizations operating in this field.

These organizations work on a wide range of technology, policy, and advocacy initiatives aimed at the development, governance, and maintenance of a public interest Internet infrastructure. They work at the local, regional, and international level, and employ a wide range of strategies and tactics to further their work.

They are all unique in their approach. For this reason, this list includes a brief description of each organization. For accuracy, and to best represent their individual outlooks, the descriptions published here are based on excerpts from their own websites.

Learning more about them, and the many other organizations, coalitions, and collectives active in this vast ecosystem, can help human rights advocates to identify paths to impactful action by joining and building on existing efforts, as well as by driving new initiatives focused on issues not yet addressed.

ACCESS NOW

Access Now is an international human rights organization dedicated to defending and extending the digital rights of users at risk around the world. By combining direct technical support, comprehensive policy engagement, global advocacy, legal interventions, grassroots grantmaking, and convenings such as RightsCon, it fights for human rights in the digital age.

Access Now mobilizes on five issue areas:

■ Privacy: Defending the right to privacy, the cornerstone for human rights in the digital age.

■ Freedom of expression: Fighting for the right to speak freely, which is critical for demonstrating dissent, guaranteeing a free press, and defending human rights.

- Digital security: Working to ensure that the online activities of civil society groups and activists, media organizations, journalists and bloggers, and human rights defenders are private, safe, and secure.

- Business and human rights: Urging companies to make their practices more transparent, accountable, and rights-respecting.

- Net discrimination: Fighting for a free and open Internet, advocating for the Net Neutrality principle that Internet access should be offered to everyone on a nondiscriminatory basis, without favoring certain websites, applications, or services.

ARTICLE 19

ARTICLE 19 works for a world where all people everywhere can freely express themselves and actively engage in public life without fear of discrimination.

It does this by working on two interlocking freedoms that set the foundation for all its work:

- Freedom to speak, concerning everyone's right to express and disseminate opinions, ideas, and information through any means, as well as to disagree with and question power-holders.

- Freedom to know, concerning the right to demand and receive information by power-holders for transparency, good governance, and sustainable development.

When either of these freedoms comes under threat, ARTICLE 19 speaks with one voice, through courts of law, through global and regional organizations, and through civil society wherever it is present.

ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS

The Association for Progressive Communications (APC) is an international network of civil society organizations founded in 1990 dedicated to empowering and supporting people working for peace, human rights, development, and protection of the environment, through the strategic use of information and communication technologies (ICTs).

It works to build a world in which all people have easy, equal and affordable access to the creative potential of ICTs to improve their lives and create more democratic and egalitarian societies.

CENTER FOR DEMOCRACY AND TECHNOLOGY

The Center for Democracy and Technology (CDT) works to promote democratic values by shaping technology policy and architecture, with a focus on the rights of the individual. It:

- Champions policies, laws, and technical designs that empower people to use technology for good while protecting against invasive, discriminatory, and exploitative uses.

- Insists online platforms be transparent, accountable, and respectful of human rights. Regulation should set limits on the collection and use of personal information and give people greater control.

- Curtails government censorship and enables all people to access and share information of their choosing without harassment or undue interference.

- Frees people from unwarranted surveillance. Government surveillance should have strict, independent oversight and checks against bias.

■ Reflects and supports the global nature of the Internet in its work.

CENTRE FOR INTERNET AND SOCIETY

The Centre for Internet and Society (CIS) is a nonprofit organization that undertakes interdisciplinary research on Internet and digital technologies from policy and academic perspectives. Its areas of focus include digital accessibility for persons with disabilities, access to knowledge, intellectual property rights, openness (including open data, free and open source software, open standards, open access, open educational resources, and open video), Internet governance, telecommunication reform, digital privacy, and cybersecurity. The research at CIS seeks to understand the reconfiguration of social processes and structures through the Internet and digital media technologies, and vice versa.

Through its diverse initiatives, CIS explores, intervenes in, and advances contemporary discourse and regulatory practices around Internet, technology, and society in India and elsewhere.

CODING RIGHTS

Coding Rights is an organization that brings an intersectional feminist approach to defend human rights in the development, regulation and use of technologies. It acts collectively and in networks, uses creativity and hacker knowledge to question the present and reimagines a future based on transfeminist and decolonial values.

Its mission is to expose and challenge technologies that reinforce power asymmetries, with a focus on gender inequalities and its intersectionalities.

Openness, transparency, diversity, equality, privacy, and freedom in the access and usages of technologies and in the interaction with governance processes are at the core of the development of a people-centered network and a democratic society.

Coding Rights' activities include research, advocacy, storytelling, development of technology tools, critical capacity building in digital security and technopolitics, and methodologies and facilitation of creative processes.

DERECHOS DIGITALES

Derechos Digitales is an independent, nonprofit organization with a Latin American scope. The organization was founded in 2005 and works towards the development, defense, and promotion of human rights in the digital space in order to promote social change around the respect and dignity of the people through advocacy on both public policy and private practices.

The organization's work focuses on three main areas: freedom of expression, privacy and personal data, and copyright and access to knowledge.

Its vision is to contribute towards a more just, inclusive, and egalitarian Latin American society, in which Derechos Digitales participates, directly and in coordination with other organizations, in the defense of human rights in the digital space so that technologies are at the service of the integral development of people.

(adapted from the original text in Spanish)

INTERNET SANS FRONTIÈRES

Internet Sans Frontières is a France-based association and an international network of nongovernmental organizations whose objective is to promote the free circulation of information and knowledge, defend digital freedoms and rights, and fight against all forms of censorship on connected networks. Internet Sans Frontières was founded in Paris in 2007 by a group of civil

society activists following the censorship of the Internet by the Burmese junta.

Internet Sans Frontières is present in Brazil, Togo, and the USA, and has a vast network of partners and collaborators.

Thanks to its global network, Internet Sans Frontières implements recognized international programs and campaigns to:

■ Protect bloggers and whistleblowers.

■ Condemn measures that prevent or disrupt access to the Internet.

■ Ensure free Internet access for all.

(adapted from the original text in French)

INTERNET SOCIETY

The Internet Society supports and promotes the development of the Internet as a global technical infrastructure and a resource to enrich people's lives.

Its work aligns with its goals for the Internet to be open, globally connected, secure, and trustworthy. It seeks collaboration with all who share these goals.

The Internet Society focuses on:

■ Building and supporting the communities that make the Internet work.

■ Advancing the development and application of Internet infrastructure, technologies, and open standards.

■ Advocating for policy that is consistent with its view of the Internet.

RANKING DIGITAL RIGHTS

Ranking Digital Rights works to promote freedom of expression and privacy on the Internet

by creating global standards and incentives for companies to respect and protect users' rights.

It does this by ranking the world's most powerful Internet, mobile, and telecommunications companies on relevant commitments and policies, based on international human rights standards. Ranking Digital Rights works with companies as well as advocates, researchers, investors, and policymakers to establish and advance global standards for corporate accountability.

RHIZOMATICA

Rhizomatica began in 2009 as a quest to make alternative telecommunications infrastructure possible for people around the world dealing with oppressive regimes, the threat of natural disaster, or the reality of living in a place deemed too poor or isolated to cover.

Its mission is to increase access to and participation in telecommunications by supporting communities to build and maintain self-governed and -owned communication infrastructure. Its approach combines regulatory activism and reform, critical engagement with technology, and the development of decentralized telecommunications infrastructure, and direct community involvement and participation.

WHOSE KNOWLEDGE?

Whose Knowledge? is a global campaign to center the knowledge of marginalized communities on the Internet.

It works particularly with women, people of color, LGBTQI communities, Indigenous peoples, and others from the global South.

Whose Knowledge? is a radical re-imagining and re-design of the Internet, to build and defend an Internet of, for, and by all.

WORLD WIDE WEB FOUNDATION

The World Wide Web Foundation is an independent, international organization fighting for digital equality—a world where everyone can access the web and use it to improve their lives.

It delivers digital equality by influencing the improvement of relevant government and business rules and regulations and securing policy change.

The World Wide Web Foundation believes that everyone has the right to access the Internet and use it freely and fully—and these principles underpin all its work. In recent years, it has influenced policies in several countries, helping to unlock the benefits of the web for hundreds of millions of people.

ABOUT THE AUTHOR

Beatrice Martini is a technology capacity builder and researcher.

She is the Education Coordinator for the Access Now Digital Security Helpline, a 24/7 free-of-charge resource providing direct technical assistance and advice to civil society groups, activists, journalists and human rights defenders.

Previously, Beatrice led the Human Rights Technology program at the nonprofit Aspiration, driving collaborative initiatives with technology capacity builders, community organizers, lawyers, and researchers supporting human rights efforts globally.

Before that, she worked at the Open Knowledge Foundation and on several projects leveraging open source technology in support of justice and rights endeavors.

She is also a research fellow at the Stanford Digital Civil Society Lab and the Harvard Kennedy School, exploring the implications of Internet infrastructure design on human rights, and serves in a formal advisory role with the Center for the Cultivation of Technology and OpenArchive.

You can follow her on Twitter @beatricemartini.